North West Adelaide Health Study

Risk Factors

Waist hip ratio

Stage 2

Epidemiological Series Report # 2007-24

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University of South Australia

THE UNIVERSITY OF ADELAIDE AUSTRALIA

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Department of Health

Introduction

The following overview presents the prevalence and incidence of central adiposity among the participants of the North West Adelaide Health Study, and the demographics and chronic conditions associated with high waist hip ratio. Stage 1 (baseline examination) of the study was conducted between 2000 and 2003, and Stage 2 (second examination) was conducted from 2004 to 2006.

Measurement and definition of central adiposity

Central adiposity as measured by waist hip ratio (WHR) can be calculated from measurements undertaken at the clinic of waist and hip circumference using a standard measuring tape. A WHR of greater than 1.0 for men or 0.85 for women is indicative of android obesity[1]. Where body mass index (BMI) is a summary of overall height and weight, or total adiposity, WHR provides a measure of fat distribution.

Incidence of central adiposity (WHR)

The incidence of developing a high waist hip ratio from Stage 1 to Stage 2 among those who had normal waist hip ratio was 34.2 incident cases per 1000 population.

The prevalence of high waist hip ratio in Stage 1 was 16.4%, which increased to 23.3% for Stage 2.

Prevalence of central adiposity – Stage 1 & Stage 2

The prevalence of high waist hip ratio according to clinical assessment for both Stage 1 and Stage 2 is shown in Table 1. Overall, in Stage 1, 16.4% (95% CI 15.3-17.6) and in Stage 2, 23.3% (95% CI 21.8-24.8) of study participants had a high waist hip ratio.

Table 1: Prevalence of central adiposity (WHR)

	Stage 1		Stage 2	
	n	**%**	**n**	**%**
Normal (WHR <= 1.0 (men) and 0.85 (women))	3393	83.6	2434	76.7
High WHR (WHR > 1.0 (men) and 0.85 (women))	665	16.4	738	23.3
Total	4058	100.0	3171	100.0

* Note: (Stage 1) 2 participants and (Stage 2) 35 participants did not provide measurements and were excluded

Overall, 11.4% of participants had their WHR increase from a normal level to a high level in Stage 2.

Transition to and from central adiposity (WHR)

Overall, 11.4% (95% CI 10.4-12.6) of participants went from having a normal WHR in Stage 1 to a high WHR in Stage 2.

Table 2: Transition to and from central adiposity according to WHR

Stage 1	**Stage 2**	**n**	**%**
Normal WHR	Normal WHR	2311	72.9
Normal WHR	High WHR	362	11.4
High WHR	High WHR	376	11.8
High WHR	Normal WHR	122	3.9
Total		3171	100.0

[1] O'Dea K, Walker K, Colagiuri S, Hepburn A, Holt P, Colagiuri R.. *Evidence Based Guidelines for Type 2 Diabetes Mellitus. Primary Prevention. Canberra: Diabetes Australia and NHMRC; 2002*

Demographic profile of people with high central adiposity (WHR)

The prevalence of central adiposity as measured by high waist hip ratio was statistically significantly higher among females, those aged over 35 years, adults living alone, or with partner but not with children, or sole parents, those widowed or those part time, casual or retired or home duties. The prevalence of high waist hip ratio significantly lower among those with a bachelor degree or higher or a trade, apprenticeship, certificate or diploma, those earning more than $20,001, or those who had never been married (Table 3).

Those with high waist hip ratio were more likely to be:
- *female;*
- *aged over 35 years;*
- *adults living without children or being a sole parent;*
- *widowed; or*
- *part time, casually employed, retired or home duties.*

Table 3: Univariate Odds Ratios for demographic variables associated with high WHR

Variable	n	%	OR	(95% CI)	p value
Sex					
Male	253/1564	16.2	1.00		
Female	485/1607	30.1	2.24	(1.88-2.65)	**<0.001**
Age group					
20 to 24 years	16/221	7.3	1.00		
25 to 34 years	66/674	9.8	1.39	(0.79-2.45)	0.26
35 to 44 years	105/646	16.3	2.49	(1.44-4.30)	**0.001**
45 to 54 years	156/562	27.8	4.90	(2.85-8.40)	**<0.001**
55 to 64 years	149/432	34.5	6.72	(3.90-11.58)	**<0.001**
65 to 74 years	120/325	36.9	7.46	(4.28-12.99)	**<0.001**
75 years and over	124/311	40.0	8.50	(4.88-14.82)	**<0.001**
Highest education level obtained*					
Secondary	448/1408	31.8	1.00		
Trade/apprenticeship/cert/diploma	207/1158	17.9	0.47	(0.39-0.56)	**<0.001**
Bachelor degree or higher	60/538	11.1	0.27	(0.20-0.36)	**<0.001**
Gross annual household income*					
Up to $20,000	209/596	35.0	1.00		
$20,001- $40,000	200/717	27.9	0.72	(0.57-0.91)	**0.006**
$40,001- $60,000	124/681	18.2	0.41	(0.32-0.53)	**<0.001**
More than $60,000	153/1032	14.8	0.32	(0.25-0.41)	**<0.001**
Family structure*					
Family & children, 2 biological/adoptive parents	203/1183	17.1	1.00		
Adult living with partner, no children	232/839	27.7	1.85	(1.50-2.29)	**<0.001**
Adult living alone	124/425	29.2	2.00	(1.54-2.58)	**<0.001**
Adults – related/unrelated, living together	67/335	19.9	1.21	(0.89-1.64)	0.23
Step/sole/shared parenting & other	95/331	28.6	1.94	(1.47-2.58)	**<0.001**
Marital status*					
Married or living with partner	489/2107	23.2	1.00		
Separated/divorced	75/271	27.7	1.27	(0.95-1.68)	0.10
Widowed	88/209	42.1	2.40	(1.79-3.22)	**<0.001**
Never married	77/557	13.9	0.53	(0.41-0.69)	**<0.001**
Work status*					
Full time employed	232/1416	16.4	1.00		
Part time/casual employed	111/527	21.1	1.37	(1.06-1.76)	**0.02**
Unemployed	18/75	23.7	1.59	(0.91-2.75)	0.10
Home duties/retired	343/975	35.2	2.77	(2.29-3.36)	**<0.001**
Student/other	23/149	15.7	0.95	(0.60-1.51)	0.84

*Not stated category not reported

High waist hip ratio was statistically significantly more likely among those who had diabetes, asthma, COPD, cardiovascular disease, arthritis or a mental health condition.

Chronic Condition profile of central adiposity (WHR)

High waist hip ratio was statistically significantly more likely among those who had diabetes, asthma, COPD, cardiovascular disease, arthritis or a mental health condition than in those without these conditions (Table 4).

Table 4: Univariate Odds Ratios for Chronic Conditions associated with high WHR

Variable	n	%	OR	(95% CI)	p value
Diabetes*					
No	618/2923	21.1	1.00		
Yes	116/226	51.2	3.92	(2.97-5.16)	**<0.001**
Asthma*					
No	588/2653	22.1	1.00		
Yes	149/517	28.8	1.43	(1.15-1.76)	**0.001**
COPD*					
No	670/2968	22.6	1.00		
Yes	51/149	34.0	1.77	(1.25-2.51)	**0.001**
Cardiovascular Disease*					
No	644/2926	22.0	1.00		
Yes	79/203	38.9	2.26	(1.68-3.04)	**<0.001**
Arthritis*					
No	465/2464	18.9	1.00		
Yes	256/652	39.2	2.77	(2.30-3.34)	**<0.001**
Mental Health Condition*					
No	570/2646	21.5	1.00		
Yes	152/481	31.7	1.69	(1.37-2.09)	**<0.001**

* Don't know/ refused/ not stated category not reported

People with a high waist hip ratio have significantly lower quality of life scores for all dimensions of the SF-36.

Quality of Life profile of central adiposity (WHR)

Figure 1 shows the mean scores of the SF-36 subscales for people with normal or high waist hip ratio. People who had a high waist hip ratio scored statistically significantly lower on all dimensions of the SF-36 when compared with those with normal waist hip ratio.

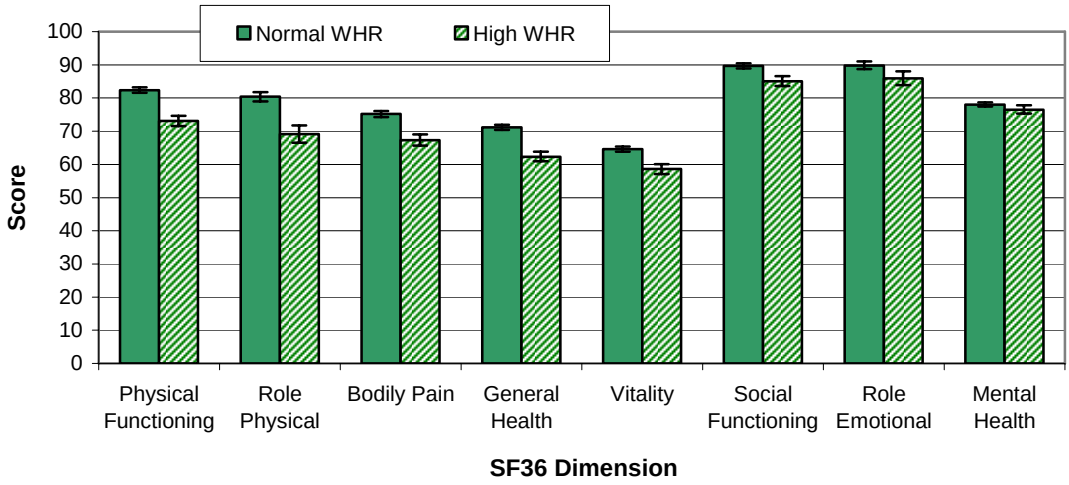

Figure 1: SF-36 mean scores for Normal and High WHR

This document is one of a series of reports concerning Stage 2 of the North West Adelaide Health Study. Please see website for other reports in the series - www.health.sa.gov.au/pros/

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